

GRAVITATIONAL FIELD WARPING

by H. W. Wallace

Summary

The dynamic interaction magnitude of mass-coupling - arising from relative motions between masses - is significant when occurring between nucleons because of great proximities and steep gravitational field gradients resulting from intense densities. An odd-A nuclide's unpaired nucleon possesses a non-magnetic moment - arising from mass-coupling - which can have energy values of two Bohr magnetons. When polarized, the macroscopic field H^K - resulting from summed moment energies - was measured. A time-variant H^K - paralleling electromagnetic theory - induces time-variant gravitational fields which interpret inertial mass as causal. Nature's abhorrence of nonhomogeneous field stresses generates forces upon gravitational field-inducing hardware acting to propel such devices towards gravipause locales.

GRAVITATIONAL FIELD WARPING

by H. W. Wallace
Southbridge, Massachusetts

If one wishes to learn of new fundamental secrets from nature, concerning gravitation, it would not be inept to explore the atomic nucleus. After all 99.98 percent, by weight, of atomic matter resides within its nucleus.

What particular properties of the nucleus might logically merit close scrutiny pursuant to such inquiry? Those theoretical models which have so ably explained atomic shell structure in terms of energy and order, e.g., Pauli's exclusion principle, magic numbers and multiplets, are now finding success in explaining the energy relationships and ordering of the nucleons; these models describe the nuclear compositions to be of also-shell-like formations. Therefore one might well look at these nuclear patterns of protons and neutrons - these nucleons - in their interrelationships within the various isotopes and isobars forming the chemical elements.

Atomic nuclei exist because the nuclear forces - interacting between nucleons - which hold the nucleus together, surpass the protons' coulomb forces, which would otherwise tear the nucleus apart.

These nuclear binding forces primarily consist of the strong-interaction but one may include the weak-interaction and even the gravitational force.

The strong-interaction is divided into the short-range force and the longer-range force. The short-range force is a pairing force. It operates between nucleons to form nucleon pairs. Three different pairings result. They are: p-n, p-p and n-n, where p and n symbolize the proton and neutron respectively. The longer-range force appears to be a force-action of combinations and permutations operating between one nucleon and the remainder. The weak-interaction is responsible for radioactive decay. The gravitational force at these infinitesimal separations, $\sim 10^{-13}$ cm, although suspect regarding Newton's inverse-square law because of this great proximity, is believed insignificant.

In the theory of relativity, proposed by Einstein in 1905, the point was made that, for some reason not yet known, motion through the ether of empty space was a meaningless concept and, further, that only motion relative to material bodies possessed any physical significance. If one considers the relative motions of the nucleons with respect to one another, not only those of spin and orbital but also oscillatory, the physical significance of such proximate relative movement between these dense particles, or bodies, becomes meaningful. The nucleon's density is of the order of 1.5×10^{13} gm cm⁻³. Its rest-mass is 1.67×10^{-24} gm. If it is reasoned that the dynamic interaction of mass-coupling [a], arising from the relative motion between bodies, is, in part,

proportional to the accelerative rates of gravitational equipotential surface penetration by one body with respect to another's while, concurrently, vice versa, the significance of the nucleon's great density becomes meaningful regarding such coupling magnitude. Although the nucleon's mass and its gravitational force attraction with neighboring nucleons are both negligible, its density approaches that of a "black hole". Consequently, the dynamic interaction magnitude of this coupling - acting within the resulting, unbelievably-steep, nonlinear [b] field gravity gradients - may well be a significant, building-block component of the nuclear strong-interaction.

We have briefly alluded to the short-range or pairing force. An example is the nucleus of the deuterium isotope of hydrogen: the deuteron; it consists of a p-n pair. In its triplet or ground state, the deuteron's nucleons are paired such that their spins [c] are additive. Consequently the deuteron possesses an angular momentum of $I=1$, $(\frac{1}{2} \hbar + \frac{1}{2} \hbar)$, and a binding energy of 2.17 Mev. If these nucleons are now reoriented so as to cancel their spins, $I=0$, the deuteron is destroyed; it is then in its singlet or excited state; its binding energy is thereby disrupted. Such experimental observations, and related others, are of profound significance for they reveal that all pairing forces are spin-dependent. Of even deeper fundamental significance, however, is the consequence of the perception which, in part, notes that the net angular momentum for both the p-p and n-n pairs, when in their binding states, is zero in direct contrast to the p-n pair.

This perception further evolves from the reasoning that, if the p-n binding state requires parallel spin vectors (additive) while the p-p and n-n binding states require antiparallel spin vectors (subtractive), then spin dependency requires the presence of non-magnetic nuclear dipole moments which, if arbitrarily assigned as antiparallel to the proton's spin vector, must then be considered parallel to the neutron's spin vector.* Consequently it is perceived that the proton and the neutron possess opposite, as-yet-uncomprehended, nucleon properties which give rise to the pairing-force field of the nuclear strong-interaction.

The tempo of this atomic exploration quickens for it is realized that the odd-A nuclide [d] possesses an unpaired nucleon; the short-range force, therefore, cannot operate to help bind it within its nucleus. Only the longer-range force interacts to hold, e.g., an unpaired proton within its nucleus against the disruptive coulomb forces of the nuclide's other protons. Surely the uncoupled, short-range-force energy of an unpaired nucleon plays a curious role within the odd-A nuclide structure.

What might be the function of this unpaired nucleon's pairing-force energy? It has been reasoned that this nonmagnetic nuclear dipole moment energy exists saliently, not only with respect to the odd-A nuclide core but also to its electron shell structure; its moment being aligned with the nucleon's spin axis [1].

* The author has chosen this particular, essentially-arbitrary, vector/moment assignment based on hypothetical considerations.

Further, it was reasoned, these nuclear moments are of sufficient energy that they interact with like-moments of adjacent and near-adjacent odd-A nuclide structure; the ambient coulomb fields causing no direct attenuation to these nonmagnetic energies [1].

The implications of such energy interactions are both far-reaching and natural. Providing the hypothesis is factual that odd-A nuclides possess salient, nonmagnetic moments which are capable of interacting with similar moments of adjacent and near-adjacent odd-A nuclides, the genesis of a macroscopic, nuclear field, in which its energies extend beyond the odd-A source material, is comprehensible.

Because this conceived, macroscopic, nuclear field was postulated to arise from the dynamic interaction of mass-coupling but specifically because of the consequent inherent field energy of the unpaired nucleon - in the form of a dipole moment salient to its nuclide - and also because of the need for its apt identification, the name "kinemassic field" was coined [1]. This nuclear field was subsequently detected and measured, by apparatus specifically designed for this purpose, in the early and mid 1960's; it has been assigned the symbol H^K where kappa denotes kinemassic. More recently this field was observed and measured in the course of NMR experimentation; it was given the name "pseudo-magnétique" field [2] by its investigators.

In order to generate the H^K field in macroscopic form so that it might emanate from material composed of odd-A nuclides,

it would be necessary to polarize the constituent H^K nuclear moments. Polarizing of these moments, in turn, would result in a summing of their respective energies sufficiently that a field strength might hopefully extend beyond the material's surface capable of measurement. Such polarization of H^K moments, then, constitutes a macroscopic kinemassic field source $\mathcal{F}^K$.

As with magnetic circuit design where, for a given magnetomotive force $\mathcal{F}$, the permeability of the field circuit structure greatly affects the resulting field magnitude H , this kinemassic field specific permeability, $\mu_S^K = B^K/\mu_0 H^K$, would enhance the field H^K magnitude for a given field source $\mathcal{F}^K$. Kinemassic field permeability [1] is analogous to magnetic field permeability: H -permeable materials possess unpaired electrons; H^K -permeable materials possess unpaired nucleons.

Creating a field source $\mathcal{F}^K$, via polarization, is attainable by optimizing a phenomenon [1] akin to the "Barnett effect" [e]. Those subatomic properties of angular momentum, dipole moment energy, and angular reorientation mobility - required for this effect - are possessed in common by both the odd-A nuclide's unpaired nucleon and the unpaired electron of ferromagnetic materials. And in many odd-A nuclides the momenta are greater than those of the electron: Co^{59} and V^{51} possess $I = 7/2 \hbar$. Also, both Co^{59} (cub) and V^{51} possess these dipole moment energies in greater magnitude than the electron's magnetic dipole moment energy by a factor of two, viz., 2.08 and 2.1 [3], in multiples of the Bohr magneton, respectively. Further, Barnett did not utilize field-circuit

permeability to enhance his effect; this parameter was effectively utilized in H^K enhancement. The H^K field has consequently been created and measured at room temperatures utilizing several odd-A isotopes and isobars [f]. Such results should not be unexpected considering, among other factors, the momentum and energy magnitudes of a number of odd-A nuclides [2] [3] [4] when contrasted with those of the electron.

In parallel with magnetic field phenomena, the kinemassic field has been measured in both its static and time-variant states [1] [5]. In its static state this field has demonstrated its ability to alter the specific heats of odd-A nuclide materials as determined both by temperature-change and electrical impedance-change measurements [1] [6]. But here we are specifically concerned with the time-variant state because of its predicted capability of gravitational field warping [5].

A time-variant electric field, when interlinked with a magnetically-permeable field circuit structure, induces therein a time-variant magnetic field which, in turn, induces an also-interlinked, time-variant secondary electric field. Theory and experimental measurement strongly indicate that a time-variant H^K field will induce an interlinked, time-variant secondary gravitational field [5].

Such reasoning, which is a logical extension of related hypotheses leading to the measurement of H^K and μ_s^K , provides the startling realization that the effects of these induced secondary

gravitational fields are commonplace experiences within our habitat; they are identified in Newton's second law. These time-variant secondary gravitational field forces are none other than the inertial forces which arise whenever matter is accelerated. The inertial property of mass, then, is indeed causal rather than innate. Consequently, when a rocket accelerates towards the moon, or when it coasts in parking orbit, it is this time-variant secondary gravitational field - in the action of stress-warping the gravitational field - which provides those stress forces necessary to overcome the pull of gravity.

Means are taught in U.S. Patent No. 3,626,605 whereby this secondary gravitational field can be generated by a time-variant kinemassic field in a far more efficient, intrinsically-different and controlled manner than by a rocket motor's mass-acceleration means. It discloses that a kinemassic-permeable material can be configured so as to envelop a time-variant kinemassic field source by utilizing an inside-out circuit structure; in so doing it causes this time-variant H^k field to induce an interlinked secondary gravitational field into a configuration which mainly imprisons it within the enveloping field circuit structure. Representative structures are schematically depicted in Figures 1 and 2.

Since nature abhors nonhomogeneous field-warping stresses - hence electromotive force - this imprisoned secondary gravitational field, in its force-action against the ambient gravitational field and, concurrently, vice versa, seeks to transport itself - along

with its interlinking, enshrouding, H^K hardware structure - upwards towards a gravipause surface [g] including the pseudorims of the LaGrangian points of gravitational equilibrium or, simply, to those spatial regions of minimum gravitational field intensity.

REFERENCES

- [1] H. W. Wallace, "U.S. Patent 3,626,606," (filed: 4 Nov. 1968, issued: 14 Dec. 1971).
- [2] A. Abragam, G. L. Bacchella, H. Glättli, P. Mériel, J. Piesvaux, and M. Pinot, C. R. Acad. Sci., Ser. B 274, 423 (1972).
- [3] C. G. Shull and R. P. Ferrier, Phys. Rev. Lett. 10, 295 (1963). Also: A. Abragam, G. L. Bacchella, H. Glättli, P. Mériel, M. Pinot, and J. Piesvaux, Phys. Rev. Lett. 31, 776 (1973). Also: A. Abragam, G. L. Bacchella, H. Glättli, P. Mériel, J. Piesvaux, and M. Pinot, Soumis pour publication au Journal de Physique Lett. (July 1975).
- [4] P. Roubeau, A. Abragam, G. L. Bacchella, H. Glättli, A. Malinowski, P. Mériel, J. Piesvaux, and M. Pinot, Phys. Rev. Lett. 33, 102 (1974).
- [5] H. W. Wallace, "U.S. Patent 3,626,605," (filed: 4 Nov. 1968, issued: 14 Dec. 1971).
- [6] H. W. Wallace, "U.S. Patent 3,823, 570," (filed: 16 Feb. 1973, issued: 16 July 1974).

DEFINITIONS AND NOTES

- [a] ...dynamic interaction of mass coupling... Equivalent to "dynamic interaction of gravitational coupling" but more accurately descriptive for the same reason that a magnetic field arises from the "dynamic interaction of charge coupling" rather than from the "dynamic interaction of electrical coupling."
- [b] ...nonlinear... The spacing of gravitational equipotential surfaces about large bodies - such as those enveloping the earth - observe a distribution in accordance with the inverse-square of distance between centers-of-mass; while this particular distribution may not precisely apply to such gradient surfaces enveloping subatomic particles, the distribution is certainly nonlinear.
- [c] ...spins... Many subatomic particles possess an intrinsic spin the energies of which may be expressed in multiples of $h/2\pi$, or $\hbar$, where h is Planck's constant. The electron, proton and neutron all possess the same spin value of $\frac{1}{2} \hbar$. The axes of these angular momenta are considered to extend through their respective centers-of-mass such that the spin vectors are aligned, either parallel or antiparallel, with their respective magnetic dipole moments. By convention, this relationship was arbitrarily established as antiparallel for the electron because of its negative charge property and, consequently, parallel for the proton.

- [d] ...nuclide... A nuclide is defined as a species of atom characterized by the structure of its nucleus and, therefore, by the number of protons, neutrons and energy contained therein. Nuclides are separated into three categories identified as "even-even," "odd-A" and "odd-odd". The even-even nuclide contains even numbers of both protons and neutrons but not necessarily of the same even number; 168 even-even nuclides occur naturally in their ground states. The odd-A nuclide consists of either an odd number of protons and an even number of neutrons or conversely; 110 odd-A nuclides are naturally-occurring in their ground states. Only six odd-odd nuclides stably exist and, as the name implies, this nuclide consists only of odd numbers of protons and of neutrons.
- [e] ..."Barnett effect"... The Barnett effect is defined by Van Nostrand's Scientific Encyclopedia, fourth edition, as follows: "In 1915, S. J. Barnett discovered that a relatively long iron cylinder, when rotated at high speed about its longitudinal axis, developed a slight magnetization, the value of which was proportional to the angular speed. He found the magnetization to be about 1.5×10^{-6} c.g.s. electromagnetic unit per revolution per sec. for a cylinder about 7 cm. in diameter and 50 cm. long. The effect was attributed to the influence of the impressed rotation upon the revolving electronic systems within the atoms. An inverse effect was discovered about the same time by

Einstein and deHaas; viz., an iron cylinder, suspended vertically, was observed to rotate slightly when suddenly magnetized."

Prof. Barnett's "high speed" was <100 r.p.s. The angular momenta, J , are an intrinsic component of these... revolving electronic systems... and are a major polarizing influence of the...impressed rotation...; the energy of the electron's magnetic moment, μ , is $\sim 0.928 \times 10^{-20}$ erg gauss $^{-1}$. The angular momenta, I , for both vanadium and cobalt, of $7/2 \hbar$, are greater than J as, also, are the energies of their nuclear moments of $\sim 1.928 \times 10^{-20}$ erg gauss $^{-1}$ and $\sim 1.909 \times 10^{-20}$ erg gauss $^{-1}$ respectively.

[f] Ni⁶¹, Cu⁶³, Cu⁶⁵, Zn⁶⁷, As⁷⁵, In¹¹³, In¹¹⁵, Sn¹¹⁵, Sn¹¹⁷, Sn¹¹⁹ & Pb¹²⁵.

[g] ...gravipause surface... Imaginary surfaces in space formed by zero gravitational field gradients, e.g., a location between the earth and moon where their respective mass contributions to the gravitational field exactly cancel.

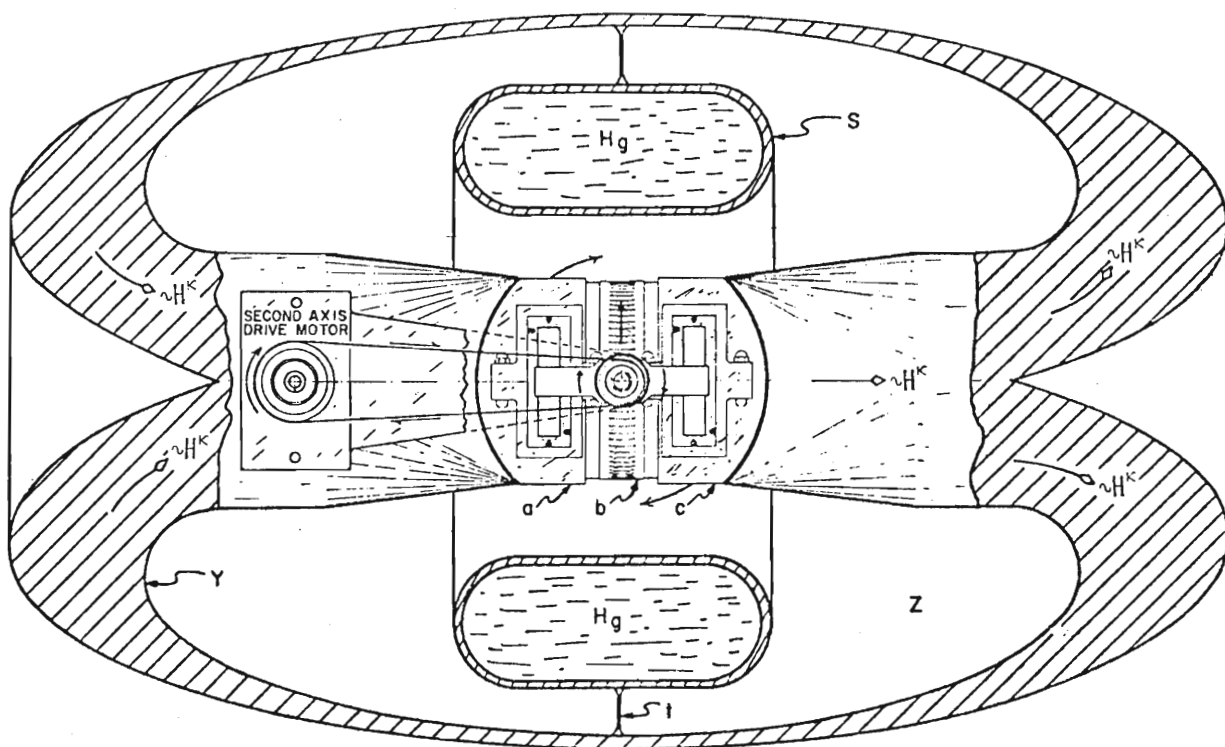


Fig. 1. Cross-sectional schematic of an "inside-out" circuit structure.

- A Field-circuit segment of odd-A nuclide material containing static H^K .
- B $\mathcal{H}^K$ source. (Spinning body composed of odd-A nuclide material).
- C Field-circuit segment of odd-A nuclide material containing static H^K .
- S Induction ring for increasing coupling between $\sim H^K$ and time-variant secondary gravitational field. (Hg, e.g., utilized for its density and ability to flow circuitously; μ_s^K not required).
- Y "inside-out", enveloping, $\sim H^K$ circuit structure. (Cross-sectional configuring of this structure - not shown - normal to the field flux, insures equal $\sim H^K$ RMS flux densities throughout the circuit structure).
- Z Toroidal chamber, interlinked with $\sim H^K$ circuit structure, within which the time-variant secondary gravitational field is induced.

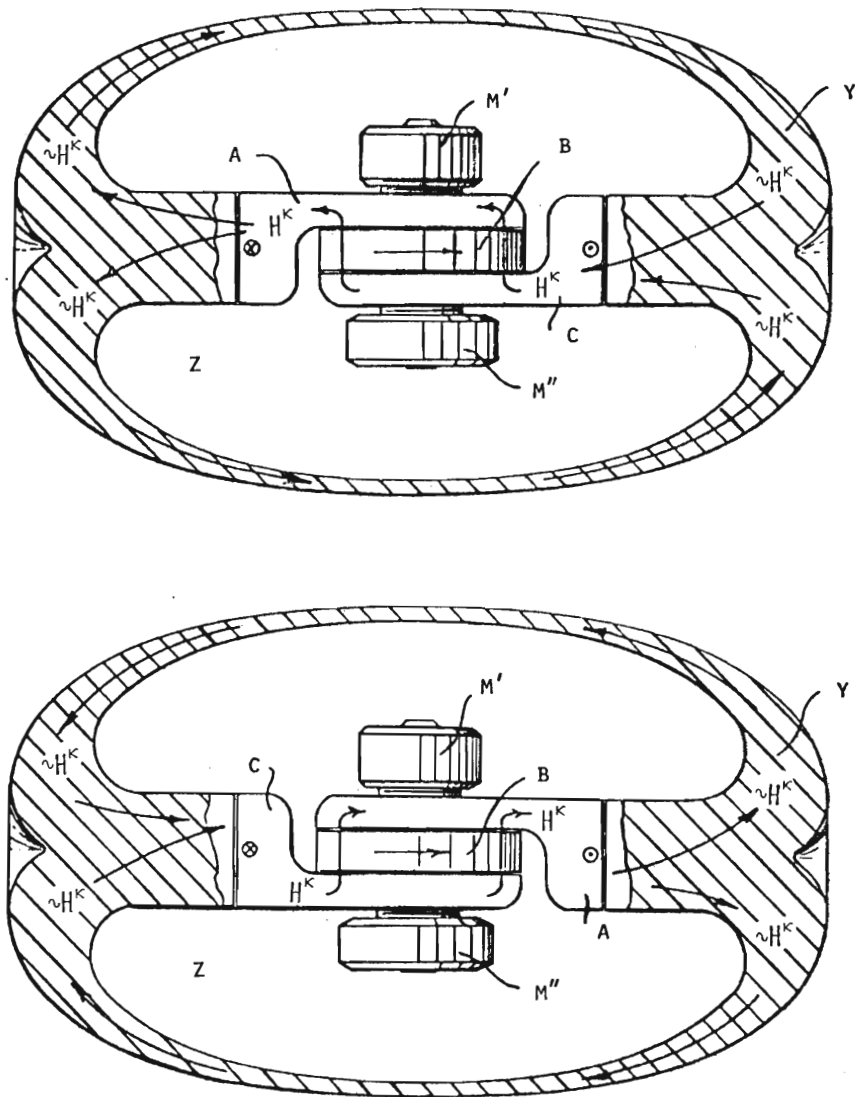


Fig. 2. Cross-sectional schematics of an "inside-out" circuit structure.

- A Identical, in function, to "A" of Fig. 1.
- B Identical, in function, to "B" of Fig. 1.
- C Identical, in function, to "C" of Fig. 1.
- M' Motor for rapidly driving spinning body "B".
- M'' Motor for causing $\sim H^K$ in "Y" by rotation of assembly "A-B-C".
- Y Identical, in function, to "Y" of Fig. 1.
- Z Identical, in function, to "Z" of Fig. 1.

BIOGRAPHICAL SKETCH

H. W. Wallace

H. W. Wallace is an employee of the American Optical Corporation where he has occupied several positions including those of Director of Machinery and Equipment Engineering and Director of General Product Development. At an earlier period he directed an advanced engineering organization within the General Electric Company as well as having held several consulting positions in their aerospace division. He has received 31 patents and patent applications and was a nominee for the 1974 "Inventor of the Year" award. Patent coverage ranges from radar innovation, for the U.S. Navy, to electrochemical devices; included are two basic U.S. patents. His formal training includes an electrical engineering degree. "Concerning my interest in gravitational/inertial phenomena, it began as a hobby in 1953, when I was attracted to the careful analysis of gyroscopic phenomena.... As so often happens, when a discovery is many years ahead of its time, the efforts to convince those people, who might have promoted a greatly expanded H^K field research activity, ended in failure. And, as was anticipated, publishing of this discovery in an appropriate journal - because of the incredulity of having hypothesized the existence of, and especially the measurement of, a hitherto undetected field - was not achieved. Finally, it was suggested - since I was from the industrial world - that I should seek publication within available industrial media; issuance of U.S. Patents 3,626,605 and 3,626,606 resulted." For those readers, interested in examining these patents, they will note the unusual feature of theoretical publication combined with mundane patent lore.